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L2 ANSWER 1 OF 18 FSTA COPYRIGHT 2004 IFIS on STN  
AN 2004:J0694 FSTA  
TI Design and optimization of hot-filling pasteurization conditions:  
**cupuacu** (Theobroma grandiflorum) fruit pulp case study.  
AU Silva, F. V. M.; Martins, R. C.; Silva, C. L. M.  
CS Escola Superior de Biotec., Univ. Catolica Portuguesa, 4200-072 Porto,  
Portugal. E-mail filipa(a)esb.ucp.pt  
SO Biotechnology Progress, (2003), 19 (4) 1261-1268, 28 ref.  
ISSN: 8756-7938  
DT Journal  
LA English  
AB **Cupuacu** (Theobroma grandiflorum) is an Amazonian tropical fruit  
with a great economic potential. Pasteurization, by a hot-filling  
technique, was suggested for preservation of the fruit pulp. The  
pasteurization process was modelled and simulated in a computer programme.  
The simulation was used to examine relative importance of the  
pasteurization process variables (initial product temp., heating rate,  
holding temp. and time, container vol. and shape, cooling medium type and  
temp.) on the microbial inhibition (using Alicyclobacillus acidoterrestris  
spores) and sensory quality of the fruit pulp. Holding temp. (T.sub.F)  
and time (t.sub.h.sub.o.sub.l.sub.d) affected pasteurization value (P),  
and container vol. (V) influenced largely the quality parameters. The  
process was optimized for retail (1 l) and industrial (100 l) size  
containers, by maximizing vol. average quality in terms of colour  
lightness and sensory 'fresh notes' and minimizing vol. average total  
colour difference and sensory 'cooked notes'. Equivalent processes were  
designed and simulated and final quality (colour, flavour, and aroma  
attributes) was evaluated. Colour was slightly affected by the  
pasteurization processes, and few differences were observed between the 6  
equivalent treatments designed (T.sub.F of 80-97.degree.C). T.sub.F  
.gtoreq.91.degree.C minimized cooked notes and maximized fresh notes of  
**cupuacu** pulp aroma and flavour for 1 l container. For 100 l size,  
development of cooked notes was minimized with T.sub.F  
.gtoreq.91.degree.C, but overall the quality was impaired markedly as a  
result of the long cooling times. A more efficient method to speed up the  
cooling phase was recommended, especially for industrial sized containers.  
CC J (Fruits, Vegetables and Nuts)  
CT BACTERIA; FRUIT PRODUCTS; FRUITS SPECIFIC; PASTEURIZATION; PULPS; SENSORY  
PROPERTIES; ALICYCLOBACILLUS ACIDOTERRESTRIS; **CUPUACU**; FRUIT  
PULPS; MODELLING

L2 ANSWER 2 OF 18 FSTA COPYRIGHT 2004 IFIS on STN  
AN 2003:N0102 FSTA

TI Cupua seed-origin fat, process for producing the same and use thereof.  
 IN Nagasawa, M.  
 PA Cupuacu International Inc.; Cupuacu International, CA, USA  
 SO PCT International Patent Application, (2002)  
 PI WO 2002081606 A1  
 PRAI JP @@@@-108335 20010406  
 DT Patent  
 LA Japanese  
 SL English  
 AB A process for producing fat from cupua (**cupuacu**; Theobroma grandiflorum) seeds, which is free from excitants such as caffeine or theobromine, is described. The fat can contribute to good health and be used for making health foods, such as chocolate.  
 CC N (Fats, Oils and Margarine)  
 CT CHOCOLATE; FATS; FRUITS SPECIFIC; HEALTH FOODS; PATENTS; PLANTS; **CUPUACU**; THEOBROMA GRANDIFLORUM  
  
 L2 ANSWER 3 OF 18 FSTA COPYRIGHT 2004 IFIS on STN  
 AN 2002:H1944 FSTA  
 TI Alicyclobacillus acidoterrestris spores as a target for **cupuacu** (Theobroma grandiflorum) nectar thermal processing: kinetic parameters and experimental methods.  
 AU Vieira, M. C.; Teixeira, A. A.; Silva, F. M.; Gaspar, N.; Silva, C. L. M.  
 CS Correspondence (Reprint) address, C. L. M. Silva, Escola Superior de Biotech., Univ. Catolica Portuguesa, 4200-072 Oporto, Portugal. Tel. +351-22-5580058. Fax +351-22-5090351. E-mail crislui(a)esb.ucp.pt  
 SO International Journal of Food Microbiology, (2002), 77 (1/2) 71-81, 36 ref.  
 ISSN: 0168-1605  
 DT Journal  
 LA English  
 AB Thermal inactivation kinetics of Alicyclobacillus acidoterrestris spores in **cupuacu** (Theobroma grandiflorum) nectar were determined using an isothermal method under batch heating and a paired equivalent isothermal exposures (PEIE) method under non-isothermal continuous conditions. PEIE was regarded as the most effective method of determining thermal inactivation kinetic parameters of A. acidoterrestris spores, particularly as the continuous system was able to eliminate errors caused by come-up and cool-down times. It is proposed that the PEIE method be used to estimate reductions in kinetic parameters when designing a thermal process for a continuous system. Optimization of thermal processing conditions in order to ensure a 5D reduction in A. acidoterrestris spores in **cupuacu** nectar was also studied, with particular reference to ascorbic acid retention. Results suggest that **cupuacu** nectar should undergo an aseptic HTST process in order to achieve spore reduction. Fortification with ascorbic acid is recommended in the event that a hot-fill-and-hold pasteurization process is preferred to HTST pasteurization.  
 CC H (Alcoholic and Non-Alcoholic Beverages)  
 CT ASCORBIC ACID; BACTERIA; BACTERIAL SPORES; FRUIT JUICES; FRUITS SPECIFIC; HEATING; ALICYCLOBACILLUS; ALICYCLOBACILLUS ACIDOTERRESTRIS; **CUPUACU**; FRUIT NECTARS; KINETICS  
  
 L2 ANSWER 4 OF 18 FSTA COPYRIGHT 2004 IFIS on STN  
 AN 2001(05):E0216 FSTA  
 TI Kinetic parameters estimation for ascorbic acid degradation in fruit nectar using the partial equivalent isothermal exposures (PEIE) method under non-isothermal continuous heating conditions.  
 AU Vieira, M. C.; Teixeira, A. A.; Silva, C. L. M.  
 CS Correspondence (Reprint) address, C. L. M. Silva, Escola Superior de Biotec., Univ. Catolica Portuguesa, 4200-072 Porto, Portugal. Tel. 351-22-5580058. Fax 351-22-5090351. E-mail crislui(a)esb.ucp.pt  
 SO Biotechnology Progress, (2001), 17 (1) 175-181, 19 ref.  
 ISSN: 8756-7938

DT Journal  
 LA English  
 AB In order to test the ability of the Paired Equivalent Isothermal Exposures (PEIE) method to determine reaction kinetic parameters under non-isothermal conditions, continuous pasteurizations were carried out with a tropical fruit nectar (25% **cupuacu** (*Theobroma grandiflorum*) pulp and 15% sugar) to estimate ascorbic acid thermal degradation kinetic parameters. 15 continuous and 7 cycled thermal exposures were studied. Experimental ascorbic acid thermal degradation kinetic parameters estimated by the PEIE method were  $E_{sub.a} = 73 \pm 9$  kJ/mol and  $k_{sub.8.sub.0.degree..sub.C} = 0.017 \pm 0.001$  min.<sup>sup.-.sup.1</sup>. These values compared very well to previously determined values for the same product under isothermal conditions ( $E_{sub.a} = 73 \pm 7$  kJ/mol,  $k_{sub.8.sub.0.degree..sub.C} = 0.020 \pm 0.001$  min.<sup>sup.-.sup.1</sup>). Predicted degrees of reaction presented a good fit to the experimental data, although the cycled thermal treatments presented some deviation. In addition to being easier and faster than the Isothermal method, the PEIE method can be a more reliable method to estimate 1st-order reaction kinetic parameters when continuous heating is considered.

CC E (Engineering)

CT ASCORBIC ACID; DECOMPOSITION; HEATING; DEGRADATION; KINETICS

L2 ANSWER 5 OF 18 FSTA COPYRIGHT 2004 IFIS on STN

AN 2000(11):J2379 FSTA

TI Free and bound flavour components of Amazonian fruits. II. **Cupuacu** volatile compounds.

AU Boulanger, R.; Crouzet, J.

CS Correspondence (Reprint) address, J. Crouzet, Lab. de Genie Biol. et Sci. des Aliments, Unite de Microbiol. et de Biochimie Ind. Associee a l'INRA, Univ. de Montpellier, 34095 Montpellier Cedex 05, France

SO Flavour and Fragrance Journal, (2000), 15 (4) 251-257, 32 ref.  
 ISSN: 0882-5734

DT Journal

LA English

AB Fruits of the **cupuacu** tree (*Theobroma grandiflorum*), which grows in the Amazonian forest, contains pulp used in making fruit juice, ice cream, jam, liquor and candy. Volatile compounds in **cupuacu** pulp were isolated by simultaneous distillation and solid phase extraction and analysed by GC-olfactometry and GC MS. Quantities of volatile compounds isolated varied between the 2 extraction techniques. 45 compounds were identified and 14 were tentatively identified. Terpene and oxygenated compounds were predominant. Components contributing to the various flavour notes of **cupuacu** were identified. Linalol (and possibly its furanic oxides),  $\alpha$ -terpineol, 2-phenylethanol, myrcene and limonene were associated with a pleasant, floral flavour. Fruity characteristics involved esters, such as ethyl 2-methylbutanoate, ethyl hexanoate and butyl butanoate, while diols contributed an exotic odour and 4-methoxy-2,5-dimethyl-3(2H)-furneone imparted an odour of wild strawberry. Another major component, hexadecanoic acid, was associated with a grassy odour. [See FSTA (2000) 32 4Jg787 for part I.]

CC J (Fruits, Vegetables and Nuts)

CT AROMA; FLAVOUR; FRUITS SPECIFIC; VOLATILE COMPOUNDS; **CUPUACU**

L2 ANSWER 6 OF 18 FSTA COPYRIGHT 2004 IFIS on STN

AN 2000(10):K0310 FSTA

TI Evaluation of the roasting of cupuasu beans (*Theobroma grandiflorum*).

AU Queiroz, M. B.; Garcia, N. H. P.

CS CEREAL/CHOCOTEC/ITAL, Caixa Postal 139, 13073 -001 Campinas, SP, Brazil.  
 Tel. 241.5222 ext. 179. Fax 241.5222 ext. 222. E-mail  
 bquieroz(a)ital.org.br

SO Brazilian Journal of Food Technology, (1999), 2 (1/2) 167-173, 16 ref.  
 ISSN: 1516-7275

DT Journal

LA Portuguese

SL English

AB Cupuasu (*Theobroma grandiflorum*) is a fruit tree grown in the Amazon basin. The fruit contain approx. 20% seeds, which contain a fat resembling cocoa butter. A chocolate-like aroma develops if the seeds are roasted. Investigations were conducted to assess formation of 7 pyrazines (2-methylpyrazine, ethylpyrazine, 2,3-dimethylpyrazine, 2,5-dimethylpyrazine, 2,6-dimethylpyrazine, 2,3,5-trimethylpyrazine and 2,3,5,6-tetramethylpyrazine) and sensory properties of **cupuacu** beans roasted in a rotating electric oven at 150.degree.C for 38, 40, 42 and 44 min. Pyrazines were analysed by GC, and sensory properties were assessed by quantitative descriptive analysis. Alkylpyrazine formation and sensory quality were best for samples roasted for 42-44 min. Possible use of cupuasu seeds to produce novel types of chocolate is briefly considered.

CC K (Cocoa and Chocolate and Sugar Confectionery Products)

CT CHOCOLATE; PLANTS; PYRAZINES; ROASTING; SENSORY PROPERTIES; **CUPUACU**; *THEOBROMA GRANDIFLORA*

L2 ANSWER 7 OF 18 FSTA COPYRIGHT 2004 IFIS on STN

AN 2000(10):J2138 FSTA

TI Quality evaluation of **cupuacu** (*Theobroma grandiflorum*) puree after pasteurization and during storage.

AU Silva, F. M.; Silva, C. L. M.

CS Escola Superior de Biotec., UCP, Rua Dr. Antonio Bernardino de Almeida, 4200-072 Porto, Portugal. E-mail filipa(a)esb.ucp.pt

SO Food Science and Technology International/Ciencia y Tecnologia de Alimentos Internacional, (2000), 6 (1) 53-58, 30 ref.  
ISSN: 1082-0132

DT Journal

LA English

SL Spanish

AB **Cupuacu** (*Theobroma grandiflorum*) is an Amazonian fruit with a pleasant aroma and flavour, which offers great economic potential. Puree from **cupuacu** pulp was pasteurized (70 and 90.degree.C), and stored for 26 wk at 18 or 38.degree.C. Pasteurization was effective in achieving microbial and enzyme inactivation. Peroxidase was inactivated (polyphenoloxidase was not detected in raw **cupuacu**), some sensory fresh notes were lost, and the colour changed slightly as a result of pasteurization at either temp. Since no significant quality differences were detected between samples processed at 70 and 90.degree.C, pasteurization at 90.degree.C is recommended to ensure microbial safety. The parameters that changed most during storage were colour, flavour, aroma and sugars. Puree became darker in colour, especially at 38.degree.C, and non-reducing sugars were converted into reducing sugars, while total sugars remained constant. Final quality was determined by storage temp. rather than by pasteurization temp. Total colour difference, TCD\* could be well modelled by first-order reversible kinetics.

CC J (Fruits, Vegetables and Nuts)

CT COLOUR; FRUIT PRODUCTS; FRUITS SPECIFIC; PASTEURIZATION; STORAGE; TEMPERATURE; **CUPUACU**; FRUIT PUREES; QUALITY; TEMP.; *THEOBROMA GRANDIFLORUM*

L2 ANSWER 8 OF 18 FSTA COPYRIGHT 2004 IFIS on STN

AN 2000(10):J2055 FSTA

TI Free and bound flavour components of Amazonian fruits: 3-glycosidically bound components of **cupuacu**.

AU Boulanger, R.; Crouzet, J.

CS Correspondence (Reprint) address, J. Crouzet, Lab. de Genie Biol. et Sci. des Aliments, Unite de Microbiol. et de Biochimie Ind. Associee a l'INRA, Univ. de Montpellier II, 34095 Montpellier Cedex 05, France. Fax +33-467-14-42-92. E-mail crouzet(a)arpb.univ-montp2.fr

SO Food Chemistry, (2000), 70 (4) 463-470, 37 ref.  
ISSN: 0308-8146

DT Journal  
 LA English  
 AB Analysis of the glycosidically bound volatile compounds present in **cupuacu**, an amazonian fruit, is reported. A glycosidic extract was prepared using solid phase extraction. Following acid and enzymic hydrolysis, the released saccharides and aglycones were identified using GC-MS, and GC-MS of trifluoracetylated (TFA) derivatives. Total quantity of aglycones released was 11.7 mg/kg of **cupuacu** pulp. 24 of the 47 identified aglycones were not present in the free volatile fraction. The most abundant aglycones were 3-methyl-butan-1-ol, 2-phenylethanol, linalol, (Z)-2,6-dimethyl-octa-2,7-dien-1,6-diol, butan-1-ol and hexan-1-ol. Analysis of the saccharides released following hydrolysis of the heterosidic extract indicated the involvement of glucose in the glycosidic and glucosidic structures and suggested the presence of rutinoides and primeverosides. Following TFA derivatization of the heterosidic extract, six .beta.-D-glucopyranosides, 5 rutinoides and 3-methyl-but-2-enyl vicianoside were identified; other glycosides were identified tentatively from their TFA mass spectra.

CC J (Fruits, Vegetables and Nuts)  
 CT FRUITS SPECIFIC; GLYCOSIDES; VOLATILE COMPOUNDS; **CUPUACU**

L2 ANSWER 9 OF 18 FSTA COPYRIGHT 2004 IFIS on STN  
 AN 2000(10):J2045 FSTA  
 TI Tropical fruit flavors: a flavorist's perspective.  
 AU Bauer, K.  
 CS Flavour Div., Dragoco Inc., Totowa, NJ, USA  
 SO Cereal Foods World, (2000), 45 (5) 204-207  
 ISSN: 0146-6283

DT Journal  
 LA English  
 AB Sensory properties of tropical fruits are described with emphasis on flavour. General flavour notes and flavour compounds present in many tropical fruits are discussed followed by individual sections covering sensory properties of: abacate avocado; abiu (egg fruit); acai; acerola (West Indian or Barbados cherry); araca (Brazilian or wild guava); araca boi; bacuri (bacury); cactus pear (prickly pear); caju (common cashew); camu-camu; carambola (starfruit); **cupuacu**; durian (civet durian); goiaba (common guava); granadilla; graviola; guarana; jabuticaba; jaca (jackfruit or nangka); jambu rosa (rose apple or plum rose); jenipape; kaki (date plum or Japanese and Chinese persimmon); kiwi; lychee; mamao (papaya); mamey; mangaba; mango; melastomataceae (melastome); monkey gourd; murici; passion fruit; pitanga (Brazilian or Surinam cherry); pomelo (Chinese grapefruit); pomegranate; sala fruit (snake skin fruit); sapote (Mexican apple); sapodilla; sapotira; starapple; tamarind; tapereba (yellow mombin); umbu; and uva (grape).

CC J (Fruits, Vegetables and Nuts)  
 CT FLAVOUR; FRUITS SPECIFIC; SENSORY PROPERTIES; TROPICAL FRUITS

L2 ANSWER 10 OF 18 FSTA COPYRIGHT 2004 IFIS on STN  
 AN 2000(10):J1985 FSTA  
 TI Establishing a new pasteurisation criterion based on Alicyclobacillus acidoterrestris spores for shelf-stable high-acidic fruit products.  
 AU Silva, F. V. M.; Gibbs, P.; Silva, C. L. M.  
 CS Escola Superior de Biotech., 4100 Porto, Portugal  
 SO Fruit Processing, (2000), 10 (4) 138-141, 18 ref.  
 ISSN: 0939-4435

DT Journal  
 LA English  
 AB Kinetic parameters (D- and z-values) for thermal inactivation of Alicyclobacillus acidoterrestris (AAT) spores in **cupuacu** pulp extracts were evaluated at 85-97.degree.C (various times allowing isothermal treatments) and the potential for growth of AAT spores in this pulp was examined under anaerobic conditions at 25 and 43.degree.C during 1 month. **Cupuacu** (Theobroma grandiflorum) is a high acid fruit.

Pasteurization treatments of varying intensity (70-90.degree.C for various periods) were conducted on pulps which were then stored in cans or flasks for 6 months under ambient conditions. After estimating the D- and z-values for spores in **cupuacu**, the N/N.sub.0 (inactivation requirements) value was calculated for the coldest point of the container during pasteurization heating, holding and cooling phases, using integration. AAT spores did not appear able to germinate or grow on **cupuacu** pulp. To achieve a 6 log reduction in AAT spores, e.g. at 91.degree.C, 27 min treatment was required, which is relatively severe and may adversely affect product quality.

CC J (Fruits, Vegetables and Nuts)

CT BACTERIA; BACTERIAL SPORES; FRUIT PRODUCTS; FRUITS SPECIFIC; PASTEURIZATION; PULPS; THERMOPHYSICAL PROPERTIES; ALICYCLOBACILLUS; **CUPUACU**; FRUIT PULPS; KINETICS; SPORES; THERMAL PROPERTIES

L2 ANSWER 11 OF 18 FSTA COPYRIGHT 2004 IFIS on STN

AN 2000(08):J1630 FSTA

TI Volatile composition of some Brazilian fruits: umbu-caja (*Spondias citherea*), camu-camu (*Myrciaria dubia*), araca-boi (*Eugenia stipitata*), and **cupuacu** (*Theobroma grandiflorum*).

AU Franco, M. R. B.; Shibamoto, T.

CS Fac. de Eng. de Alimentos, UNICAMP, Campinas-SP, CP 6121, CEP 13081-970, Brazil. Tel. 55 19 7887090. Fax 55 19 2897819. E-mail franco(a)fea.unicamp.br

SO Journal of Agricultural and Food Chemistry, (2000), 48 (4) 1263-1265, 3 ref.

ISSN: 0021-8561

DT Journal

LA English

AB Umbu-caja (*Spondias citherea*), camu-camu (*Myrciaria dubia*), araca-boi (*Eugenia stipitata*) and **cupuacu** (*Theobroma grandiflorum*) are tropical fruits from Brazil which show economic potential due to their distinct exotic flavours. In this study, the volatile composition of these fruits was investigated. 21 volatile compounds were identified for the first time by GC MS in umbu-caja and camu-camu; 30 volatile compounds were identified in araca-boi. Terpenic compounds predominated among the volatile compounds in these fruit samples, with the major compounds being identified as cis-.beta.-ocimene and caryophyllene in umbu-caja; .alpha.-pinene and d-limonene were the most abundant volatile compounds in the headspace of camu-camu. Sesquiterpenes were the most abundant compounds in araca-boi, with germacrene D presenting the highest relative percentage. Esters predominated in **cupuacu**; ethyl butyrate and hexanoate were the major compounds in the headspace of this Amazonian fruit.

CC J (Fruits, Vegetables and Nuts)

CT FRUITS; VOLATILE COMPOUNDS; BRAZIL

L2 ANSWER 12 OF 18 FSTA COPYRIGHT 2004 IFIS on STN

AN 2000(07):J1538 FSTA

TI Kinetics of flavour and aroma changes in thermally processed **cupuacu** (*Theobroma grandiflorum*) pulp.

AU Silva, F. M.; Sims, C.; Balaban, M. O.; Silva, C. L. M.; O'Keefe, S.

CS Escola Superior de Biotec.-UCP, Rua Dr. Antonio Bernardino de Almeida, P-4200-072 Porto, Portugal. E-mail filipa(a)esb.ucp.pt

SO Journal of the Science of Food and Agriculture, (2000), 80 (6) 783-787, 19 ref.

ISSN: 0022-5142

DT Journal

LA English

AB *Theobroma grandiflorum* (**cupuacu**) is an Amazonian fruit popular in Brazil for use in nectar, chocolate fillings and desserts. Effects of thermal treatments on changes in fresh and cooked flavour notes and aroma of **cupuacu** were evaluated, and kinetic parameters for destruction of fresh notes and formation of cooked notes were modelled

based on data from a sensory panel. Samples of **cupuacu** were held at 70, 80, 90 and 98.degree.C in a water bath for 2-120 min and were cooled by immersion in ice slush. A simple first-order equation was developed for modelling changes in fresh notes and a reversible first-order equation for modelling changes in cooked notes. Cooked note changes were linearly related to fresh note changes, but changes in cooked notes provided a better index of deterioration in sensory properties on heating.

CC J (Fruits, Vegetables and Nuts)

CT AROMA; FLAVOUR; FRUITS SPECIFIC; HEATING; KINETICS; MODELLING; THEOBROMA GRANDIFLORUM

L2 ANSWER 13 OF 18 FSTA COPYRIGHT 2004 IFIS on STN

AN 2000(04):H0838 FSTA

TI Mathematical modeling of the thermal degradation kinetics of vitamin C in **cupuacu** (Theobroma grandiflorum) nectar.

AU Vieira, M. C.; Teixeira, A. A.; Silva, C. L. M.

CS Correspondence (Reprint) address, C. L. M. Silva, Escola Superior de Biotecnologia, Univ. Catolica Portuguesa, 4200 Porto, Portugal. Tel +351-2-5580058. Fax +351-2-090351. E-mail mvieira(a)ualg.pt

SO Journal of Food Engineering, (2000), 43 (1) 1-7, 26 ref. ISSN: 0260-8774

DT Journal

LA English

AB In order to evaluate effects of thermal processing on nutritional quality of nectar from **cupuacu** (Theobroma grandiflorum) fruits, knowledge of the degradation of vitamin C at different temp. is required. The aim of this study was to model thermal degradation of 2 forms of vitamin C (ascorbic acid (AA) and dehydroascorbic acid (DHAA)) in **cupuacu** nectar using an isothermal method. **Cupuacu** pulp was mixed with deionized water and refined sugar in order to obtain nectar containing 25% pulp and 15% sugar. Nectar samples were subjected to thermal treatments at 6 different temp. (60, 70, 75, 80, 90 and 99.degree.C) for holding times ranging from 0 to 240 min. AA and DHAA were determined before and after thermal treatments by HPLC with UV detection and using isoascorbic acid as internal standard. Results demonstrated that AA degraded into DHAA during thermal treatment. The mechanism of AA degradation was adequately described by a reversible first order model; estimated rate constant at 80.degree.C and activation energy were 0.032  $\pm$  0.003 min.<sup>-1</sup> and 74  $\pm$  5 kJ/mol, respectively. Kinetic behaviour of DHAA suggested that a consecutive first order reaction occurs where DHAA is the intermediate product formed during AA degradation. DHAA concn. formed from AA could be predicted using a proposed mechanistic model, where temp. dependence and kinetic parameters for AA degradation were estimated by the Arrhenius equation which replaced rate constants in the first model. Activation energy and rate constant (80.degree.C) estimated by the mechanistic model were 65.9 kJ/mol and 0.013  $\pm$  0.003 min.<sup>-1</sup>, respectively. It is concluded that the proposed model provides accurate predictions of DHAA in **cupuacu** nectar and could help in selecting thermal processing conditions which minimize vitamin C degradation and maximize nutritional quality of **cupuacu** nectar.

CC H (Alcoholic and Non-Alcoholic Beverages)

CT ASCORBIC ACID; FRUIT JUICES; FRUITS SPECIFIC; PROCESSING THERMAL; **CUPUACU**; FRUIT NECTARS; MODELLING; THERMAL PROCESSING; VITAMIN C

→ L2 ANSWER 14 OF 18 FSTA COPYRIGHT 2004 IFIS on STN

AN 2000(03):K0074 FSTA

TI The fat of Theobroma grandiflorum 'cupuacu' seeds - substitute for cocoa butter.

AU Silva, W. G. da; Baruffaldi, R.; Oliveira, M. N.; Fedeli, E.

CS Fundacao para a Conservacao de Biodiversidade da Amazonia, Manaus, Amazonas, Brazil

SO Industrie Alimentari, (1999), 38 (381) 546-548, 559, 18 ref.



ISSN: 0019-901X

DT Journal

LA Italian

SL English

AB Samples of **cupuacu** (*Theobroma grandiflorum*) seed fat were analysed to assess possible use of this fat as a cocoa butter substitute. Data are given for physicochemical properties, and fatty acid, glyceride, sterol, aliphatic alcohol, triterpene alcohol and hydrocarbon compositions of **cupuacu** seed fat; for many of these characteristics, data are also included for cocoa butter. Physicochemical properties of **cupuacu** seed fat were generally similar to those of cocoa butter, except that **cupuacu** seed fat had a lower m.p. (29-30.degree.C) than cocoa butter (34-36.degree.C). Fatty acid composition differed between the 2 fats: **cupuacu** seed fat had higher oleic and arachic acid concn. but lower palmitic acid concn. than cocoa butter. It is concluded that **cupuacu** seed fat might be of use as a cocoa butter substitute; modification by interesterification or fractionation to increase the m.p. would be advantageous.

CC K (Cocoa and Chocolate and Sugar Confectionery Products)

CT COCOA BUTTER; FATS VEGETABLE; PHYSICAL PROPERTIES; COCOA BUTTER EQUIVALENTS; COMPOSITION; **CUPUACU SEED FATS**; PHYSICOCHEMICAL PROPERTIES

L2 ANSWER 15 OF 18 FSTA COPYRIGHT 2004 IFIS on STN

AN 2000(02):H0269 FSTA

TI Thermal inactivation of *Alicyclobacillus acidoterrestris* spores under different temperature, soluble solids and pH conditions for the design of fruit processes.

AU Silva, F. M.; Gibbs, P.; Vieira, M. C.; Silva, C. L. M.

CS Escola Superior de Biotecnologia-UCP, Rua Dr. Antonio Bernadino de Almeida, P-4200 Porto, Portugal. Tel. +351-2-558-0058. Fax +351-2-509-0351. E-mail filipa(a)esb.ucp.pt

SO International Journal of Food Microbiology, (1999), 51 (2/3) 95-103, 20 ref.

ISSN: 0168-1605

DT Journal

LA English

AB Effects of total soluble solids (SS; 5-60.degree. Brix or % by wt. of sucrose), temp. (T; 85-97.degree.C) and pH (2.5-6.0) on decimal reduction times (D-values) of *Alicyclobacillus acidoterrestris* (a spore-forming bacterium commonly found in spoiled, pasteurized fruit juices) spores (NCIMB 13137) were investigated using response surface methodology (RSM) techniques. Response of D-values in malt extract broth to a central composite experimental design which was face-centred was 0.498 +/- 0.045-94.9 +/- 6.7 min. D-values were most affected by temp.; SS and pH values had a lesser effect. D-values decreased linearly with decreasing pH and SS, while increasing temp. caused D-values to decrease in a non-linear fashion. Data were fitted to a 2nd order polynomial ( $R_{\text{sup.2}} = 0.98$ ), but D-values of real fruit systems (apples, grape and orange juices, exotic fruit (**cupuacu**) extract, orange juice drink, blackcurrant concentrates) were greater than values predicted using the broth malt extract model. It is concluded that experimental validation of model-derived process data is essential.

CC H (Alcoholic and Non-Alcoholic Beverages)

CT ANALYTICAL TECHNIQUES; BACTERIA; FRUIT JUICES; PH; SOLIDS; TEMPERATURE; *ALICYCLOBACILLUS ACIDOTERRESTRIS*; DECIMAL REDUCTION TIMES; RESPONSE SURFACE METHODOLOGY; SOLUBLE SOLIDS; TEMP.

→ L2 ANSWER 16 OF 18 FSTA COPYRIGHT 2004 IFIS on STN

AN 1999(09):J2216 FSTA

TI Colour changes in thermally processed **cupuacu** (*Theobroma grandiflorum*) puree: critical times and kinetics modelling.

AU Silva, F. M.; Silva, C. L. M.

CS Correspondence (Reprint) address, C. L. M. Silva, Escola Superior de

Biotech. UCP, Rua Dr Antonio Bernardino de Almeida, P-4200 Porto,  
Portugal. Tel. 351 2 5580058. Fax 351 2 5090351. E-mail  
crislui(a)esb.ucp.pt

SO International Journal of Food Science & Technology, (1999), 34 (1) 87-94,  
29 ref.

ISSN: 0950-5423

DT Journal

LA English

AB Colour changes in thermally treated **cupuacu** (*Theobroma grandiflorum*) fruit puree were modelled mathematically. Isothermal experiments in the temp. range of 80-115.degree.C were performed, and colour was measured by a tristimulus colorimeter. At each temp., total colour difference (TCD\*) increased and normalized L\* decreased with processing time, with both following a power law model. Power of the model was temp.-dependent and described by the Arrhenius law. To estimate the model constants, a 1-step non-linear regression was performed on all data. Activation energies of 31 and 36 kJ/mol were determined for TCD\* and normalized L\*, respectively. Results should prove useful in the design of pasteurization processes which minimize colour changes in **cupuacu** puree.

CC J (Fruits, Vegetables and Nuts)

CT COLOUR; FRUIT PRODUCTS; FRUITS SPECIFIC; PROCESSING THERMAL; PULPS;  
TEMPERATURE; **CUPUACU PUREES**; FRUIT PUREES; MODELLING; TEMP.

L2 ANSWER 17 OF 18 FSTA COPYRIGHT 2004 IFIS on STN

AN 1996(03):J0064 FSTA

TI A contribution to the analysis of the flavor of **cupuacu** fruit  
(*Theobroma grandiflorum* Spreng.).

AU Fischer, N.

CS Dragoco AG, Res. Div., D-37601 Holminden, Germany

SO Fruit Processing, (1995), 5 (3) 61-65, 19 ref.

DT Journal

LA English

AB Flavour of **cupuacu** (*Theobroma grandiflorum* Spreng.) pulp was analysed by obtaining flavour extracts using solvent extraction, vacuum distillation, simultaneous distillation and extraction and solid phase enrichment on reversed phase material. Flavour extracts were tested by sensory evaluation, GC, GC olfactometry and GC-MS to determine principal constituents and components of greatest importance to **cupuacu** flavour. Compounds of significant sensory importance were identified.

CC J (Fruits, Vegetables and Nuts)

CT FLAVOUR COMPOUNDS; FRUITS SPECIFIC; **CUPUACU**

L2 ANSWER 18 OF 18 FSTA COPYRIGHT 2004 IFIS on STN

AN 1979(11):J1816 FSTA

TI Volatile composition of certain Amazonian fruits.

AU Aloes, S.; Jennings, W. G.

CS Dep. of Food Sci. & Tech., Univ. of California, Davis, California 95616,  
USA

SO Food Chemistry, (1979), 4 (2) 149-159, 14 ref.

DT Journal

LA English

AB Volatile constituents of several Amazonian fruits (bacuri, **cupuacu**, maruci and tapereba) were isolated by steam distillation-extraction of pulp or juice from the canned fruits. Essences were subjected to GLC analysis in high resolution wall-coated open tubular glass capillary columns; identification of the volatile components was based on MS analysis supported by GLC retentions under linearly temp.-programmed conditions. Considered individually, none of the compounds identified duplicated the aroma of any of these fruits. Many of them do, however, contribute fruity notes. This indicates that the typical aroma of each individual fruit is due not to one compound but is probably the result of an integrated response to the contribution of a wide spectrum of compounds.

CC J (Fruits, Vegetables and Nuts)  
CT AROMA COMPOUNDS; FRUITS; FRUITS SPECIFIC; VOLATILE COMPOUNDS; AMAZON;  
BACURI; CAPUACU; MARUCI; TAPERIBA; VOLATILE

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=> s cupuacu(w)oil

29 CUPUACU

669414 OIL

L3

0 CUPUACU(W)OIL

=> s cupuacu

L4

29 CUPUACU

=> d l4 cbib,ab 1-29

L4 ANSWER 1 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN

2003:832856 New Bioactive Polyphenols from Theobroma grandiflorum ("Cupuacu"). Yang, Hui; Protiva, Petr; Cui, Baoliang; Ma, Cuiying; Baggett, Scott; Hequet, Vanessa; Mori, Scott; Weinstein, I. Bernard; Kennelly, Edward J. (Department of Biological Sciences, Lehman College, The City University of New York, Bronx, NY, 10468, USA). Journal of Natural Products, 66(11), 1501-1504 (English) 2003. CODEN: JNPRDF. ISSN: 0163-3864. Publisher: American Chemical Society.

AB Activity-guided fractionation of Theobroma grandiflorum ("cupuacu") seeds resulted in the identification of two new sulfated flavonoid glycosides, theograndins I (1) and II (2). In addn., nine known flavonoid antioxidants, (+)-catechin, (-)-epicatechin, isoscutellarein 8-O-.beta.-D-glucuronide, hypolaetin 8-O-.beta.-D-glucuronide, quercetin 3-O-.beta.-D-glucuronide, quercetin 3-O-.beta.-D-glucuronide 6'''-Me ester, quercetin, kaempferol, and isoscutellarein 8-O-.beta.-D-glucuronide 6'''-Me ester, were identified. Theograndin II (2) displayed antioxidant activity (IC50 = 120.2 .mu.M) in the 1,1-diphenyl-2-picrylhydrazyl (DPPH) free-radical assay, as well as weak cytotoxicity in the HCT-116 and SW-480 human colon cancer cell lines with IC50 values of 143 and 125 .mu.M, resp. While 1 was less active as an antioxidant than 2, the known compds. were more potent in the DPPH assay (IC50 range 39.7-89.7 .mu.M).

L4 ANSWER 2 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN

2003:758991 Determination of high molecular mass compounds from Amazonian plant's leaves. Soares de Siqueira, Denilson; Pereira, Alberto dos Santos; Radler de Aquino Neto, Radler; Cabral, Jose Augusto; Cid Ferreira, Carlos Alberto; Simoneit, Bernd R. T.; Elias, Vladimir O. (Instituto de Quimica, Universidade Federal do Rio de Janeiro, Rio de Janeiro, 21949-900, Brazil). Quimica Nova, 26(5), 633-640 (Portuguese) 2003. CODEN: QUNODK. ISSN: 0100-4042. Publisher: Sociedade Brasileira de Quimica.

AB The fractions of dichloromethane exts. of leaves from andiroba (*Carapa guianensis* - Meliaceae), caapi (*Banisteriopsis caapi* - Malpighiaceae), cocoa (*Theobroma cacao* - Sterculiaceae), Brazil nut (*Bertholletia excelsa* - Lecytidaceae), **cupuacu** (*Theobroma grandiflorum* - Sterculiaceae), marupa, (*Simaruba amara* - Simaroubaceae) and rubber tree (*Hevea brasiliensis* - Euphorbiaceae), were analyzed by HT-HRGC and HT-HRGC-MS. Esters of homologous series of fatty acids and long chain alcs., phytol, amyrines and tocopherols were characterized. The characterization of the compds. was based mainly in mass spectra data and in addn. by usual spectrometric data (1H and 13C NMR, IR).

L4 ANSWER 3 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN

2003:708782 Extraction of fat from fermented **Cupuacu** seeds with supercritical solvents. de Azevedo, Alvaro B. A.; Kopcak, Uiram; Mohamed, Rahoma S. (School of Chemical Engineering, State University of Campinas, Campinas, 13083-970, Brazil). Journal of Supercritical Fluids, 27(2), 223-237 (English) 2003. CODEN: JSFLEH. ISSN: 0896-8446. Publisher: Elsevier Science B.V..

AB **Cupuacu** (*Theobroma grandiflorum*) is a Brazilian Amazonian fruit. The seeds have a high fat content (62%) with characteristics that resemble that of cocoa butter and with potential applications in the cosmetic, pharmaceutical and food industries. In this work, new exptl. data on the supercrit. fluid extn. of fat components from **Cupuacu** fermented seeds using ethane and CO<sub>2</sub> as solvents are reported. The extns. were carried out at 50 and 70.degree.C and pressure ranging from 24.8 to 35.2 MPa. The results revealed ethane to be the most efficient solvent in the removal of fat as compared to CO<sub>2</sub>. While both solvents were found effective in the removal of **Cupuacu** fat from the fermented seeds, triglyceride (TG) compns. as measured by HPLC and thermal behavior of extd. products obtained by differential scanning calorimeter revealed little fractionation capacity of either solvent. The lack of fractionation, obsd. earlier in the fractionation of milk fat is attributed to the similar TG components in **Cupuacu** fat (C:48-C:56). Solid fraction as well as m.p. and enthalpy analyses indicated however slight changes in the satd./unsatd. TG ratios in the extd. fractions as compared to the original fat.

L4 ANSWER 4 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN

2003:421374 Anti-inflammatory properties of Amazonian oils. Kelly, Damian; Bessiere, J.; Crimmins, J.; Renard, S. (Croda Chemicals Europe, East Yorkshire, DN14 9AA, UK). SOFW Journal, 129(4), 12, 14, 16-17 (English) 2003. CODEN: SOFJEE. ISSN: 0942-7694. Publisher: Verlag fuer Chemische Industrie H. Ziolkowsky.

AB Crodamazon oils represent a product range with great functionality, particularly in improving the signs of skin inflammation. Crodamazon **Cupuacu** can improve the skin barrier after disruption, increase moisturization and reduce erythema. The Crodamazon oil, particularly the Crodamazon Ccupuacu, contains high content of phytosterols and vitamin E. Other Crodamazon oil products include Crodamazon Maracuja, Crodamazon Pequi, Crodamazon Castanha do Brazil, and Crodamazon Buriti.

L4 ANSWER 5 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN

2003:397163 Document No. 139:116482 Design and Optimization of Hot-Filling Pasteurization Conditions: **Cupuacu** (*Theobroma grandiflorum*)

Fruit Pulp Case Study. Silva, Filipa V. M.; Martins, Rui C.; Silva, Cristina L. M. (Escola Superior de Biotechnologia, Universidade Catolica Portuguesa, Oporto, 4200-072, Port.). Biotechnology Progress, 19(4), 1261-1268 (English) 2003. CODEN: BIPRET. ISSN: 8756-7938. Publisher: American Chemical Society.

- AB **Cupuacu** (*Theobroma grandiflorum*) is an Amazonian tropical fruit with a great economic potential. Pasteurization, by a hot-filling technique, was suggested for the preservation of this fruit pulp at room temp. The process was implemented with local communities in Brazil. The process was modeled, and a computer program was written in Turbo Pascal. The relative importance among the pasteurization process variables (initial product temp., heating rate, holding temp. and time, container vol. and shape, cooling medium type and temp.) on the microbial target and quality was investigated, by performing simulations according to a screening factorial design. Simulations of the different processing conditions were carried out. The holding temp. (TF) and time (t<sub>hold</sub>) affected pasteurization value (P), and the container vol. (V) influenced largely the quality parameters. The process was optimized for retail (1 L) and industrial (100 L) size containers, by maximizing vol. av. quality in terms of color lightness and sensory "fresh notes" and minimizing vol. av. total color difference and sensory "cooked notes". Equivalent processes were designed and simulated (P<sub>91.degree.C</sub> = 4.6 min on *Alicyclobacillus acidoterrestris* spores) and final quality (color, flavor, and aroma attributes) was evaluated. Color was slightly affected by the pasteurization processes, and few differences were obsd. between the six equiv. treatments designed (TF between 80 and 97 .degree.C). TF .gtoreq. 91 .degree.C minimized "cooked notes" and maximized "fresh notes" of **cupuacu** pulp aroma and flavor for 1 L container. Concerning the 100 L size, the "cooked notes" development can be minimized with TF .gtoreq. 91 .degree.C, but overall the quality was greatly degraded as a result of the long cooling times. A more efficient method to speed up the cooling phase was recommended, esp. for the industrial size of containers.

- L4 ANSWER 6 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN  
2002:921106 Document No. 138:353043 Evaluation of the Cariogenic Potential of Cassava Flours from the Amazonian Region. Rebelo Vieira, J. M.; Rebelo, M. A. B.; Cury, J. A. (Faculty of Health Sciences, Federal University of Amazon, Manaus, Brazil). Caries Research, 36(6), 417-422 (English) 2002. CODEN: CAREBK. ISSN: 0008-6568. Publisher: S. Karger AG.

- AB The cariogenic potentials of the two main kinds of cassava flour - 'seca' and 'd'agua' - were evaluated in vivo and in vitro. A sweet made from a regional fruit (**cupuacu**) and a species of local fish (tambaqui) were used as pos. and neg. controls, resp. For in vivo evaluation of dental plaque acidogenicity, the study had a crossover design, in four legs, with 19 volunteers in four treatment groups. Dental plaque pH was detd. by the microtouch method before and for 60 min after food consumption. For in vitro evaluation, stimulated saliva of each volunteer was incubated with the food and pH variation was detd. over 4 h. Carbohydrates were chem. detd. in the flours and the majority was found to be water-insol. In vivo, plaque pH decreased significantly after the consumption of the sweet ( $p < 0.05$ ), increased after the fish ( $p < 0.05$ ), but did not change after intake of the flours ( $p > 0.05$ ). In vitro, the flours were slowly fermented by bacteria present in saliva. The in vivo and in vitro findings suggest that, in the form that the main cassava flours from the Amazonian region of Brazil are customarily eaten, they may be considered to have no or very low cariogenicity.

- L4 ANSWER 7 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN  
2002:793727 Document No. 137:293983 Production of fats from **cupuacu** (*theobroma grandiflorum*) seeds for health foods, cosmetics, or drug delivery. Nagasawa, Makoto (Cupuacu International, Inc., USA). PCT Int. Appl. WO 2002081606 A1 20021017, 32 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CN, CO, CR, CU, CZ, DM, DZ,

EC, EE, GD, GE, HR, HU, ID, IL, IN, IS, JP, KG, KR, KZ, LC, LK, LR, LT, LV, MA, MD, MG, MK, MN, MX, NO, NZ, OM, PH, PL, RO, RU, SG, SI, SK, TJ, TM, TN, TT, UA, US, VZ, VN, YU, ZA, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (Japanese). CODEN: PIXXD2. APPLICATION: WO 2002-JP3472 20020405. PRIORITY: JP 2001-108335 20010406.

AB Title process, for prodn. of **cupuacu** fats free of any excitants such as caffeine or theobromine for health foods such as chocolate substitutes, comprises (A) fermenting **cupuacu** seeds; (B) baking with far-IR radiation; (C) threshing to obtain germs; (D) grinding to obtain the raw **cupuacu**; and (E) squeezing to give the fats.

L4 ANSWER 8 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN

2001:554448 Document No. 136:4821 The aromatic potential of Amazonian fruits. Boulanger, R.; Chassagne, D.; Montesinos, T.; Sakho, M.; Crouzet, J. (Laboratoire de Genie Biologique et Sciences des Aliments, Unite de Microbiologie et Biochimie Industrielles Associee a l'INRA, Montpellier, 34095, Fr.). Frontiers of Flavour Science, [Proceedings of the Weurman Flavour Research Symposium], 9th, Freising, Germany, June 22-25, 1999, Meeting Date 1999, 457-462. Editor(s): Schieberle, Peter; Engel, Karl-Heinz. Deutsche Forschungsanstalt fuer Lebensmittelchemie: Garching, Germany. (English) 2000. CODEN: 69BOX5.

AB A review with refs. The detn. of total aglycons released by enzymic hydrolysis of **cupuacu**, bacuri, and acerola glycosidic exts. indicates significant amts. of glycosidically bound volatile components in these fruits. Glucosides and rutinoides were the main glycoconjugates present as indicated by structural anal. of the saccharidic moieties. Moreover malonylated derivs. were detected in bacuri and **cupuacu**; and "unusual" glycosides were possible constituents of the heterosidic fraction of Amazonian fruits. In **cupuacu**, aliph. and terpenic alcs. were characteristic volatile compds. liberated by enzymic hydrolysis of glycosides. Terpenic alcs. and diols, as well as 2-phenylethanol, were the most abundant aglycons in bacuri, whereas aliph. alcs. and norisoprenoid compds. were detected as major components of acerola glycosidically bound volatiles. In agreement with the results obtained for aglycon detns., several glucosides, rutinoides and one vicianoid were identified in these fruits by GC/EI-MS and/or GC/NCI-MS of their TFA derivs.

L4 ANSWER 9 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN

2001:487149 Document No. 135:272400 Soil nitrogen mineralization under tree crops and a legume cover crop in multi-strata agroforestry in Central Amazonia: Spatial and temporal patterns. Schroth, G.; Salazar, E.; Da Silva, J. P., Jr. (Institute of Applied Botany, University of Hamburg, Germany). Experimental Agriculture, 37(2), 253-267 (English) 2001. CODEN: EXAGAL. ISSN: 0014-4797. Publisher: Cambridge University Press.

AB Under rain forest vegetation, the central Amazonian Ferralsols are characterized by relatively high availability of N in relation to other nutrients. After forest clearing, several tree crops also have not shown yield responses to N fertilizer. To elucidate the mechanisms of this apparent N sufficiency, the mineralization of soil N was measured under three tree crops and a leguminous cover crop (*Pueraria phaseoloides*) in a multi-strata agroforestry system at two fertilizer input levels on a Xanthic Ferralsol in central Amazonia. In situ incubations of topsoil (0-10 cm) were carried out using the buried-bag method on five occasions over ten months. The highest mineralization rates were found under the cover crop, intermediate rates under rubber trees (*Hevea brasiliensis*) where the soil was also covered by the cover crop, and lowest rates under peach palm (*Bactris gasipaes*) and **cupuacu** (*Theobroma grandiflorum*) with no cover crop. The increased N mineralization under the cover crop was due to more total N in the soil, higher soil moisture and, presumably, a larger pool of readily mineralizable soil N compared with the soil under the tree crops. Other fertility parameters also

differed significantly between sampling positions within the plots, but this had no major influence on net N mineralization. Also, the input of NPK fertilizer and dolomite had no significant influence on N mineralization, indicating that N mineralization was not nutrient-limited. High total N mineralization rates in the soil (approx. 350 kg ha<sup>-1</sup> a<sup>-1</sup> at 0-10 cm depth) explained earlier observations of nitrate leaching into the subsoil under multi-strata agroforestry at this site. Considering the spatial patterns of N mineralization with max. values under the cover crop, the exploration of the soil vol. by crop roots should be maximized to increase the uptake of mineralized soil N by the crops and reduce nitrate leaching. Appropriate measures are narrow tree spacing, use of annual and semi-perennial intercrops and encouragement of the lateral root development of the trees. In addn., the mineralization of soil N close to the tree crops can be influenced through the management of the cover crop. In view of the high total N mineralization rates in the system and unclear yield responses of tree crops to N fertilizer, the application of N fertilizer to tree crops with well-developed root systems and a well-managed cover crop may often be unnecessary on this soil type. This may facilitate the further development of tree crop agriculture in the region.

L4 ANSWER 10 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN

2001:438351 Document No. 135:210509 Growth, yields and mineral nutrition of **cupuacu** (*Theobroma grandiflorum*) in two multi-strata agroforestry systems on a ferralitic amazonian upland soil at four fertilization levels. Schroth, G.; Elias, M. E. A.; Macedo, J. L. V.; D'Angelo, S. A.; Lieberei, R. (Institute of Applied Botany, University of Hamburg, Germany). *Journal of Applied Botany*, 75(1/2), 67-74 (English) 2001. CODEN: JABOFH. ISSN: 0949-5460. Publisher: Blackwell Wissenschafts-Verlag GmbH.

AB **Cupuacu** (*Theobroma grandiflorum*) is an economically important Amazonian tree crop and a common component of agroforestry systems on the infertile soils of the Amazon region. To provide farmers with recommendations on nutrient management for this species, information on the relationships between fertilizer input, nutrient availability in the soil, foliar nutrient levels, growth and yield of the trees under the local pedoclimatic conditions are required. **Cupuacu** was grown for seven years in two multi-strata agroforestry systems with four fertilization levels on a xanthic Ferralsol in central Amazonia. Yields were measured during the last four years, and the biomass of the trees was estd. from an allometric regression in the last year. Growth and yield data were compared with soil and leaf analyses from both systems. In one system, leaf samples of three age classes and four collection dates during a year were analyzed to det. a sampling protocol with max. sensitivity for differences in mineral nutrition for the species. The **cupuacu** yields were significantly influenced by fertilization level and cropping system. Soil and leaf analyses suggested that the yield response was mainly to P fertilizer, whereas N fertilizer did not seem to affect growth and yields of the plants. The soil data were easier to relate to the **cupuacu** yields than the leaf data, apparently because the trees responded to greater nutrient inputs with increased vegetative growth rather than with increased nutrient concns. in the leaves. However, foliar analyses gave useful addnl. information on limiting nutrients and suggested that the trees in an unlimed treatment developed a latent Mg deficiency which may affect crop yields in the future. The pronounced difference in growth and yield of **cupuacu** between the two multi-strata systems could not be explained with foliar analyses, and with soil analyses only by taking into account the fertility of the soil under previous intercrops planted between the trees. Sampling recommendations for foliar anal. of **cupuacu** are given. For soil anal. in agroforestry systems with spatially heterogeneous nutrient availability in the soil, sampling of a sufficiently large area around the target trees is essential.

L4 ANSWER 11 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN

2001:265546 Document No. 134:279960 Fat originating in **cupuacu** seed, producing process and use thereof. Nagasawa, Makoto; Numata, Hiroyuki (Asahi Foods Co., Ltd., Japan). PCT Int. Appl. WO 2001025377 A1 20010412, 22 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CN, CR, CU, CZ, DM, DZ, EE, GD, GE, HR, HU, ID, IL, IN, IS, KG, KR, KZ, LC, LK, LR, LT, LV, MA, MD, MG, MK, MN, MX, NO, NZ, PL, RO, RU, SG, SI, SK, TJ, TM, TR, TT, UA, US, UZ, VN, YU, ZA, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (Japanese). CODEN: PIXXD2. APPLICATION: WO 2000-JP7039 20001010. PRIORITY: JP 1999-287077 19991007; JP 1999-328944 19991119; JP 1999-357584 19991216; JP 2000-104297 20000406.

AB Fat originating in **cupuacu** [*Theobroma grandiflorum* (Willderow ex Sprengel) Schumann] seed, which is free from any analeptic substances such as caffeine or theobromine, is useful for keeping good health. The **cupuacu** fat compns. contg. lecithin and cacao butter are used to manuf. health food such as chocolate-like products.

L4 ANSWER 12 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN

2001:80506 Document No. 134:207270 Nitrogen use in mixed tree crop plantations with a legume cover crop. Lehmann, Johannes; Da Silva, Jose Pereira, Jr.; Schroth, Gotz; Gebauer, Gerhard; Da Silva, Luciana Ferreira (Institute of Soil Science and Soil Geography, University of Bayreuth, Bayreuth, Germany). Plant and Soil, 225(1-2), 63-72 (English) 2000. CODEN: PLSOA2. ISSN: 0032-079X. Publisher: Kluwer Academic Publishers.

AB In a multi-strata agroforestry system in central Amazonia, we studied N use of two indigenous fruit tree species, *Theobroma grandiflorum* Willd. (ex Spreng.) K. Schum. (**cupuacu**) and *Bactris gasipaes* Kunth. (peachpalm) for heart of palm prodn., and a legume cover crop, *Pueraria phaseoloides* Roxb. (Benth.) (pueraria). 15N was applied at a rate of 1 kg ha<sup>-1</sup> twice at the beginning and at the peak of the rainy season, in a split plot design under either **cupuacu**, peachpalm or pueraria together with fertilizer N usually applied (95.4 and 42.4 g N tree<sup>-1</sup> for **cupuacu** and peachpalm, resp.). Plant and soil 15N content and total 15N uptake were measured for 1 yr. The highest N uptake by the trees occurred from areas underneath their canopy, being >70% of their total N uptake. During the dry season, pueraria also took up most of its N (>70%) from the area underneath its own canopy. During the rainy season, however, pueraria utilized N from the area under **cupuacu** (27-40%) and peachpalm (34-47% of the total N uptake by pueraria). **Cupuacu** took up between 12 and 26% of its N from the area covered by pueraria, peachpalm slightly less with 10 to 18% (significant only at the end of the rainy season; P<0.05). Competition for N uptake between the trees was negligible. The above-ground recovery was highest in **cupuacu** (15% of the applied 15N), followed by pueraria (11%) and peachpalm (3%). Pueraria proved to be very important for the N cycling in the mixed tree cropping system, recovering most (31%) of the applied 15N in plant and soil in comparison to **cupuacu** (20%) and peachpalm (21%). However, the natural 15N abundance of the tree leaves did not show a significant transfer of biol.-fixed N<sub>2</sub> from pueraria to the trees (P>0.05) and the cover crop did not improve tree N nutrition. The investigated fruit trees did not benefit from biol.-fixed N<sub>2</sub> of the legume cover crop due to their low lateral root activity and the high available soil N contents, largely being an effect of the amt. and placement of mineral fertilizer.

L4 ANSWER 13 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN

2001:4827 Document No. 134:206921 Kinetic Parameters Estimation for Ascorbic Acid Degradation in Fruit Nectar Using the Partial Equivalent Isothermal Exposures (PEIE) Method under Non-Isothermal Continuous Heating Conditions. Vieira, Margarida C.; Teixeira, Arthur A.; Silva, Cristina L. M. (Escola Superior de Biotecnologia, Univ. Catolica Portuguesa, Oporto, 4200-072, Port.). Biotechnology Progress, 17(1), 175-181 (English) 2001.



CODEN: BIPRET. ISSN: 8756-7938. Publisher: American Chemical Society.

- AB With the purpose of testing the Paired Equiv. Isothermal Exposures (PEIE) method to det. reaction kinetic parameters under non-isothermal conditions, continuous pasteurizations were carried out with a tropical fruit nectar [25% **cupuacu** (*Theobroma grandiflorum*) pulp and 15% sugar] to est. the ascorbic acid thermal degrdn. kinetic parameters. Fifteen continuous thermal exposures were studied, with seven being cycled. The exptl. ascorbic acid thermal degrdn. kinetic parameters were estd. by the PEIE method ( $E_a = 73 \pm 9$  kJ/mol,  $k_{80.\text{degree.C}} = 0.017 \pm 0.001$  min<sup>-1</sup>). These values compared very well to the previously detd. values for the same product under isothermal conditions ( $E_a = 73 \pm 7$  kJ/mol,  $k_{80.\text{degree.C}} = 0.020 \pm 0.001$  min<sup>-1</sup>). The predicted extents of reaction presented a good fit to the exptl. data, although the cycled thermal treatments presented some deviation. In addn. to being easier and faster than the Isothermal method, the PEIE method can be a more reliable method to est. first-order reaction kinetic parameters when continuous heating is considered.

L4 ANSWER 14 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN

2000:681334 Document No. 134:339792 Free and bound flavour components of amazonian fruits: 2. **Cupuacu** volatile compounds. Boulanger, R.; Crouzet, J. (Universite de Montpellier II, Laboratoire de Genie Biologique et Sciences des Aliments, Unite de Microbiologie et de Biochimie Industrielles Associee a l'INRA, Montpellier, 34095/05, Fr.). Flavour and Fragrance Journal, 15(4), 251-257 (English) 2000. CODEN: FFJOED. ISSN: 0882-5734. Publisher: John Wiley & Sons Ltd..

- AB Forty-five volatile compds. were identified and 14 tentatively identified in **cupuacu** (*Theobroma grandiflorum*) pulp using solid phase extn. on XAD-2 and simultaneous distn. extn. Among them, 35 compds. were reported for the first time in this fruit. The olfactive characteristics of several compds., sepd. after solid phase extn., and their odor activity values showed that linalol,  $\alpha$ -terpineol, 2-phenylethanol, myrcene, and limonene were contributors of the **cupuacu** pleasant, floral flavor. Et 2-methylbutanoate, Et hexanoate and Bu butanoate were involved in the typical fruity characteristics of **cupuacu**. Diols (2,6-dimethyl-oct-7-en-2,6-diol, (E)-2,6-dimethyl-octa-2,7-dien-1,6-diol, and its (Z) isomer) and methoxy-2,5-dimethyl-3(2H)-furanone were possible contributors of the typical exotic odor. Moreover, hexadecanoic acid can be considered as a contributor of the grassy, heavy odor of **cupuacu**.

L4 ANSWER 15 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN

2000:578427 Document No. 133:237297 Effect of five tree crops and a cover crop in multi-strata agroforestry at two fertilization levels on soil fertility and soil solution chemistry in central Amazonia. Schroth, Gotz; Teixeira, Wenceslau Geraldes; Seixas, Rosangela; Da Silva, Luciana Ferreira; Schaller, Michaela; Macedo, Jeferson L. V.; Zech, Wolfgang (Institute of Soil Science and Soil Geography, University of Bayreuth, Bayreuth, 95440, Germany). Plant and Soil, 221(2), 143-156 (English) 2000. CODEN: PLSOA2. ISSN: 0032-079X. Publisher: Kluwer Academic Publishers.

- AB The spatio-temporal patterns of soil fertility and soil soln. chem. in a multi-strata agroforestry system with perennial crops were analyzed as indicators for the effects of crop species and management measures on soil conditions under permanent agriculture in central Amazonia. The study was carried out in a plantation with locally important tree crop species and a leguminous cover crop at two fertilization levels on a xanthic Ferralsol. Soil fertility to 2 m soil depth was evaluated 3.5 yr after the establishment of the plantation, and soil soln. chem. at 10, 60 and 200 cm soil depth was monitored over 2 yr. Several soil fertility characteristics exhibited spatial patterns within the multi-strata plots which reflected the differing properties of the plant species and their management, including the fertilizer input. Significant differences between species could be detected to 150 cm depth, and between

fertilization treatments to 200 cm depth. Favorable effects on nutrient availability in the soil were found for annatto (*Bixa orellana*) (P,K) and **cupuacu** (*Theobroma grandiflorum*) (Ca, Mg) in comparison with peach palm (*Bactris gasipaes*) and Brazil nut (*Bertholletia excelsa*). Nutrient concns. of the soil soln. showed pronounced fluctuations in the topsoil, corresponding to fertilizer applications. Large nutrient concns. in the soil soln. were accompanied by increased concns. of aluminum and low pH values, caused by exchange reactions between fertilizer and sorbed acidity and reinforced by the acidifying effect of nitrification. The soil soln. under the leguminous cover crop *Pueraria phaseoloides* had relatively large N concns. during periods when those under the tree crops were small, and this could partly explain why no yield responses to N fertilization were obsd. at this site.

L4 ANSWER 16 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN

2000:470250 Document No. 133:237019 Free and bound flavor components of Amazonian fruits 3-glycosidically bound components of **cupuacu**. Boulanger, R.; Crouzet, J. (Unite de Microbiologie et de Biochimie Industrielles Associee a l'INRA, Laboratoire de Genie Biologique et Sciences des Aliments, Universite de Montpellier II, Montpellier, Fr.). Food Chemistry, 70(4), 463-470 (English) 2000. CODEN: FOCHDJ. ISSN: 0308-8146. Publisher: Elsevier Science Ltd..

AB The total quantity (11.7 mg/kg of pulp) of aglycons released by enzymic hydrolysis of the glycosidic ext. indicates a significant aroma potential for **cupuacu**. Among the 47 aglycons identified, 24 are not present in the free volatile fraction, among them, 4-methylguaiacol, 4-propylguaiacol, 2,6-dimethylocta-1,7-diene-3,6-diol, 2,6-dimethyloct-7-ene-1,6-diol, homovanillic acid, 2-methylbut-3-en-1-ol and acetic acid. The quant. most important aglycons are 3-methylbutan-1-ol, 2-phenylethanol, linalool, (Z)-2,6-dimethylocta-2,7-diene-1,6-diol, butan-1-ol and hexan-1-ol. The methylated alditol acetates anal. of monosaccharides released by acid hydrolysis of the heterosidic ext., indicates that glucose is involved in glucosidic and glycosidic structures. Moreover, rhamnopyranose and xylopyranose units, bound in the terminal position, suggest the presence of rutinoides and small amts. of primeverosides. Six glucosides, hexyl, benzyl, 2-phenylethyl, (R) and (S)-linalyl and geranyl .beta.-d-glucopyranosides, 5 rutinoides, benzyl, (R) and (S)-linalyl, .alpha.-terpinyl and 2-phenylethyl rutinoides and 3-methylbut-2-enyl vicianoside were identified by GC-EIMS after TFA derivatization of the crude heterosidic fraction. Moreover, 4 linalool oxides, octyl, 3-methylbutyl .beta.-D-glucopyranosides and hexyl, octyl, 2 linalool oxides and 3-methylbutyl rutinoides, have been tentatively identified from their TFA mass spectra. Some glucosides are probably substituted by malonyl and unidentified acyl residues.

L4 ANSWER 17 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN

2000:258253 Document No. 133:29844 Kinetics of flavor and aroma changes in thermally processed **cupuacu** (*Theobroma grandiflorum*) pulp. Silva, Filipa M.; Sims, Charles; Balaban, Murat O.; Silva, Cristina L. M.; O'Keefe, Sean (Escola Superior de Biotecnologia-UCP, Oporto, P-4200-072, Port.). Journal of the Science of Food and Agriculture, 80(6), 783-787 (English) 2000. CODEN: JSFAAE. ISSN: 0022-5142. Publisher: John Wiley & Sons Ltd..

AB Changes in "fresh" and "cooked-notes" during thermal treatment of **cupuacu** (*T. grandiflorum*) pulp were evaluated and modeled. Isothermal expts. in the temp. range of 70-98.degree.C were carried out and a non-linear regression was performed to all data to est. kinetic parameters. "Fresh" and "cooked-notes" change followed simple 1st-order ( $E_a = 78-82 \text{ kJ.cntdot.mol}^{-1}$ ,  $z = 30-31 \text{ .degree.C}$ ) and reversible 1st order ( $E_a = 80-85 \text{ kJ.cntdot.mol}^{-1}$ ) kinetics, resp. Although "cooked-notes" were linearly correlated with "fresh-notes" ( $R^2 = 0.99$ ), the former was a better indicator for quality degrdn. These results are useful to design pasteurization processes while minimizing sensory changes.

L4 ANSWER 18 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN

2000:158259 Document No. 132:307538 Volatile Composition of Some Brazilian Fruits: Umbu-caja (*Spondias cytherea*), Camu-camu (*Myrciaria dubia*), Araca-boi (*Eugenia stipitata*), and **Cupuacu** (*Theobroma grandiflorum*). Franco, Maria Regina B.; Shibamoto, Takayushi (Faculdade de Engenharia de Alimentos, UNICAMP, Campinas, 13081-970, Brazil). Journal of Agricultural and Food Chemistry, 48(4), 1263-1265 (English) 2000. CODEN: JAFCAU. ISSN: 0021-8561. Publisher: American Chemical Society.

AB Twenty-one volatile compds. were identified for the first time by GC-MS in umbu-caja and in camu-camu, plus 30 volatile compds. were identified in araca-boi samples. Terpenic compds. predominated among the volatile compds. in these fruit samples, with the major compds. being identified as cis-.beta.-ocimene and caryophyllene in the northeastern fruit umbu-caja; .alpha.-pinene and d-limonene were the most abundant volatile compds. in the headspace of the Amazonian fruit camu-camu. Sesquiterpenes were the most abundant compds. in the araca-boi sample, with germacrene D presenting a higher relative percentage. The chem. class of esters predominated in the **cupuacu** sample. Et butyrate and hexanoate were the major compds. in the headspace of this Amazonian fruit.

L4 ANSWER 19 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN

1999:447796 Document No. 131:143787 The fat of *Theobroma grandiflorum* "**Cupuacu**" seeds as a substitute for cocoa butter. Gomes da Silva, W.; Baruffaldi, Renato; Oliveira, Marice Nogueira; Fedeli, E. (Fundacao para a Conservacao da Biodiversidade da Amazonia, Manaus, Brazil). Industrie Alimentari (Pinerolo, Italy), 38(381), 546-548, 559 (Italian) 1999. CODEN: INALBB. ISSN: 0019-901X. Publisher: Chiriotti Editori spa.

AB The fat of **cupuacu** seeds was analyzed to check the possibility of its use as a substitute for cocoa butter. Fat physicochem. properties (refraction index, m.p., acidity, iodine no., sapon. no., ether-sol. nonsaponifiables) and fatty acid, sterol, hydrocarbon, and aliph. and triterpenic alc. compn. were detd. The main components do not differ from those of other fats currently used for this purpose.

→ L4 ANSWER 20 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN

1999:363872 Document No. 131:129191 Colour changes in thermally processed **cupuacu** (*Theobroma grandiflorum*) puree: critical times and kinetics modelling. Silva, Filipa M.; Silva, Cristina L. M. (Escola Superior de Biotecnologia - UCP, Oporto, P-4200, Port.). International Journal of Food Science and Technology, 34(1), 87-94 (English) 1999. CODEN: IJFTEZ. ISSN: 0950-5423. Publisher: Blackwell Science Ltd..

AB Color changes in thermally treated **cupuacu** (*Theobroma grandiflorum*) fruit puree were modelled math. Isothermal expts. in the temp. range of 80-115.degree.C were performed and color was measured by a tristimulus colorimeter. At each temp. total color difference (TCD\*) increased and normalized L\* decreased with processing time, both following a power law model. The power of the model was temp.-dependent and described by the Arrhenius law. To est. the model consts., a one-step non-linear regression was performed on all data. Activation energies of 31 and 36 kJ/mol were detd. for TCD\* and normalized L\*, resp. These results should prove useful in the design of pasteurization processes which minimize color changes in **cupuacu** puree.

L4 ANSWER 21 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN

1997:626866 Document No. 127:290736 Biochemical composition of *Theobroma grandiflorum* leaves infected by *Crinipellis pernicioso*. da Conceicao, Heraclito Eugenio; Mazzafera, Paulo; da Rocha Neto, Olinto Gomes; Stein, Ruth Linda Benchimol (Lab. Ecofisiol., Embrapa-CPATU, Belem, 66095-100, Brazil). Revista Brasileira de Fisiologia Vegetal, 9(2), 135-138 (English) 1997. CODEN: RBFVEG. ISSN: 0103-3131. Publisher: Sociedade Brasileira de Fisiologia Vegetal.

AB **Cupuacu** (*Theobroma grandiflorum* Schum.) has fruit prodn.

severely affected by the development of the witches' broom disease, caused by the fungus *Crinipellis perniciosa* (Stahel) Singer. In order to investigate the biochem. alterations in infected plants, healthy and infected leaves were compared regarding to the contents of sol. sugars, starch, proteins, chlorophyll, sol. phenolics and tannins. In general, healthy leaves showed the highest contents of the analyzed compds.

L4 ANSWER 22 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN

1995:881632 Document No. 123:338381 Symptoms of nutritional deficiencies in **cupuacu** plants (*Theobroma grandiflorum*) grown in nutrient solution. Salvador, J.O.; Muraoka, T.; Rossetto, R.; Ribeiro, G. de A. (Centro de Energia Nuclear na Agricultura, Piracicaba, 13400-970, Brazil). *Scientia Agricola* (Piracicaba, Brazil), 51(3), 407-14 (Portuguese) 1994. CODEN: SGRIEF. ISSN: 0103-9016. Publisher: Universidade de Sao Paulo, Campus de Piracicaba.

AB **Cupuacu** seedlings were grown in a greenhouse, in nutrient soln. with omission of N, P, K, Ca, Mg, S, B, Cu, Fe, Mn or Zn, in comparison with a complete treatment. All visual symptoms of deficiencies are described and presented in an identification table; the symptoms show great similarity with those in cocoa plants. To assess nutrient concns., leaves were collected at different parts of the plants, in two samplings. Concns. found in leaves from plants in which an element was omitted were always lower than those found in the complete treatment; thus, the symptoms were really due to the induced deficiency. Although the mineral contents of leaves with deficiency symptoms were always lower than those found in other samplings, the ref. leaf, recommended in the literature for cocoa (3rd leaf from the apex), was also adequate for **cupuacu**, except in the case of Cu.

L4 ANSWER 23 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN

1995:802154 Document No. 123:284139 A contribution to the analysis of the flavor of **cupuacu** fruit (*Theobroma grandiflorum* Spreng.). Fischer, N.; Hammerschmidt, F.-J.; Brunke, E.-J. (Research Division, Drago-co AG, Holzminden, D-37601, Germany). *Fruit Processing*, 5(3), 61-5 (English) 1995. CODEN: FRPREY. ISSN: 0939-4435. Publisher: Fluessiges Obst GmbH.

AB Components of sensory importance in vapor distillates of **cupuacu** pulp and in ether eluate from solid-phase exts. of cupuacu juice are identified. Flavor relevant fruit acids are also identified in the fruit pulp and these results can be used in compositional work to formulate a **cupuacu** flavor or to develop new tropical fruit flavors.

L4 ANSWER 24 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN

1995:684892 Document No. 123:81994 Analytical investigation of the flavor of **cupuacu** (*Theobroma grandiflorum* Spreng.). Fischer, Norbert; Hammerschmidt, Franz-Josef; Brunke, Ernst-Joachim (Research Department, DRAGOCO AG, Holzminden, D-37601, Germany). *ACS Symposium Series*, 596(Fruit Flavors), 8-20 (English) 1995. CODEN: ACSMC8. ISSN: 0097-6156. Publisher: American Chemical Society.

AB The **cupuacu** (*Theobroma grandiflorum* Spreng.) tree, a relative of cocoa (*Theobroma cacao* L.), is indigenous to Amazonia, Brazil. The pulp of its fruits is consumed e.g. in juices, ice creams or bakery fillings, esp. in Brazilian Belem region. As a part of an ongoing project aimed at the investigation of less common tropical fruit flavors, the flavor of **cupuacu** pulp was analyzed. Flavor exts. were prepd. by using vacuum distn., solid phase extn. and simultaneous steam distn.-extn. (SDE). The concs. were evaluated sensorially and analyzed by GC-, GC/MS- and GC-O techniques. Several major to minor components of sensory importance for the **cupuacu** flavor were identified along with a no. of trace constituents with very high flavor impact. The portion of short-chain acids, responsible for the typical acidic aspects of **cupuacu** flavor, is mainly assocd. with the fibrous part of the pulp, whereas the distillate is dominated by several esters. 2-Ethyl-5-methyl-4-hydroxy-3(2H)-furanone could be identified as an

important trace component in the conc. obtained by solid-phase extn. on RP-18 material. Thermal treatment of **cupuacu** pulp produced addnl. a breadlike flavor impression, for which 2-acetyl-1-pyrroline was responsible.

L4 ANSWER 25 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN

1995:426540 Document No. 122:185877 Preparation of a milk gel containing **cupuacu** (*Theobroma grandiflorum*, Schum) syrup. Damasceno, Cristina Maria Rocha; Neves, Elisa Cristina Andrade (Departamento de Engenharia Quimica, Universidade Federal do Para, Brazil). *Anais da Associacao Brasileira de Quimica*, 43(1-2), 70-4 (Portuguese) 1994. CODEN: AABQAL. ISSN: 0365-0073. Publisher: Associacao Brasileira de Quimica.

AB The gelling activity of starch and cassava starch in conjunction with agar, CMC, and sodium alginate was assessed for the prodn. of a milk gel prepn. contg. artificial vanilla flavor and **cupuacu** syrup. The use of starch had neg. effects on consistency. The most acceptable product contained 0.3% agar, 2.5% starch, and 3% cassava starch.

L4 ANSWER 26 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN

1992:19780 Document No. 116:19780 Fruits [tropical, aroma compounds]. IV. Winterhalter, Peter (Univ. Wuerzburg, Wuerzburg, Germany). *Food Science and Technology* (New York, NY, United States), 44(Volatile Compd. Foods Beverages), 389-409 (English) 1991. CODEN: FSTEEM. ISSN: 0891-8961.

AB A review with 72 refs. on the aroma compns. of tropical fruits: avocado, babaco, bacuri, beli, cashew apple, cherimoya, **cupuacu**, durian, feijoa, fig, guava, jackfruit, kiwifruit, litchi, mango, mangosteen, mountain papaya, olive, papaya, passionfruit, prickly pear, quince, rose-apple, sapodilla fruit, soursop, tamarind, tapereba, wood apple.

L4 ANSWER 27 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN

1991:630568 Document No. 115:230568 The flavor of exotic fruit. Young, Harry; Paterson, Vivienne J. (Div. Hortic. Process., Dep. Sci. Ind. Res., Auckland, N. Z.). *Developments in Food Science*, 3C(Food Flavours, Pt. C), 281-326 (English) 1990. CODEN: DFSCDX. ISSN: 0167-4501.

AB A review with 85 refs. covering the aroma compds. of kiwifruit, feijoa (*F. sellowiana*), roseapple (*Syzygium jambos*), cherimoya, custard apple (*Annona atemoya* and related species), soursop (*A. muricata*), carambola, cashew apple, mountain papaya (*Carica pubescens*), babaco (*C. pentagona*), jackfruit, durian, mangosteen, loquat, beli fruit (*Aegle marmelos*), wood apple, sapodilla, tamarind, dalieb (*Borassus aethiopum*), prickly pear, pepino (*Solanum muricatum*), bacuri (*Platonia insignis*), **cupuacu** (*Theobroma grandiflora*), muruci (*Brysonima crassifolia*), and tapereba (*Spondias lutea*).

L4 ANSWER 28 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN

1979:454845 Document No. 91:54845 Volatile composition of certain Amazonian fruits. Alves, S.; Jennings, W. G. (Dep. Food Sci. Technol., Univ. California, Davis, CA, 95616, USA). *Food Chemistry*, 4(2), 149-59 (English) 1979. CODEN: FOCHDJ. ISSN: 0308-8146.

AB The volatile constituents of several Amazonian fruits, bacuri (*Platonia insignis*), **cupuacu** (*Theobroma grandiflora*), maruci (*Byrsonima crassifolia*), and tapereba (*Spondias lutea*), were isolated by steam distn.-extn. of pulp or juice from the canned fruits. Essences were subjected to gas chromatog. in wall-coated open tubular glass capillary columns; identification of the volatile constituents was based on mass spectral anal., supported by gas chromatog. retentions under linearly temp.-programmed conditions. Considered individually, none of the compds. identified duplicates the aroma of any of these fruits. Many do, however, contribute fruity notes.

L4 ANSWER 29 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN

1964:71351 Document No. 60:71351 Original Reference No. 60:12588g-h **Cupuacu**, piquia, pupunha. Philocreon, Neuracy Cals (Fac. Pharm., Univ. Para, Brazil). *Anais de Farmacia e Quimica de Sao Paulo*, 13(11-12),

92-7 (Unavailable) 1962. CODEN: AFQSAZ. ISSN: 0003-2441.

AB The compn. (moisture, ash, lipids, carbohydrates, proteins, fiber) of edible parts of Theobroma grandiflorum (**cupuacu**), Caryocar glabrum (piquia), and Guilielma speciosa (pupunha) fruits from northern Brazil was studied. The pulp of T. grandiflorum has no food value, but the seeds contain appreciable amts. of proteins, lipids, and minerals. C. glabrum contains a high content of lipids in the pulp. G. speciosa has a high carbohydrate content.

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	SINCE FILE	TOTAL
COST IN U.S. DOLLARS	ENTRY	SESSION
FULL ESTIMATED COST	83.65	122.16

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COST IN U.S. DOLLARS	ENTRY	SESSION
FULL ESTIMATED COST	0.79	122.95

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CA SUBSCRIBER PRICE	0.00	-20.10

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-	47	cupuacu	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2004/01/07 11:26
-	1	cupuacu adj oil	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2004/01/07 11:26